Digital Distractions: Correlating Social Media Time-Spent with Academic Performance

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Abstract This study investigates the relationship between the amount of time senior secondary students spend on digital social media and their academic performance, measured through half-yearly examination scores. The research draws on a sample of 800 students from five Kendriya Vidyalayas in Patna, Bihar, employing quantitative methods including descriptive statistics and Pearson correlation analysis. Results indicate a statistically significant negative correlation between prolonged social media use (exceeding three hours per day) and academic achievement. The findings underscore the necessity for digital discipline and provide recommendations for educators, parents, and policymakers to mitigate the detrimental effects of excessive screen time.

Keywords: Academic Performance, Digital social media, Education, Coorelation,

1. Introduction

The unprecedented rise of digital social media has fundamentally altered how students engage with their academic environment. Platforms such as Instagram, YouTube, WhatsApp, and TikTok have become integral parts of daily adolescent life, influencing communication, information consumption, and even learning habits. For many students, social media serves as a tool for collaboration, peer interaction, and quick access to educational resources. However, the ubiquity of these platforms also brings new challenges, particularly concerning distraction, fragmented attention, and academic disengagement.

In an era where the boundaries between entertainment and education are increasingly blurred, students often struggle to differentiate between productive engagement and passive scrolling. The addictive design of social media—characterized by infinite scrolling, notifications, and algorithm-driven content—can easily consume time intended for study or rest. This behavioral pattern, often unnoticed by students themselves, can disrupt the cognitive processes necessary for learning, such as sustained attention, working memory, and information retention.

Moreover, the transition from traditional learning environments to hybrid and digitally integrated systems has compounded the dependence on electronic devices. Assignments, exams, peer discussions, and lectures often occur online, making it difficult to separate academic tasks from

social media interactions. As a result, students may become mentally fatigued from constant digital multitasking, which can adversely affect academic motivation and performance.

In India, the proliferation of affordable smartphones and data plans has accelerated internet access across socio-economic strata. According to a report by the Internet and Mobile Association of India (IAMAI), over 66% of adolescents now have regular internet access, with a majority using it for social media engagement. This digital revolution has opened up unprecedented opportunities for learning, but it has also led to growing concerns among educators, psychologists, and parents regarding its impact on students' academic focus and emotional well-being.

The senior secondary stage—comprising classes 11 and 12—is a critical academic period that lays the foundation for future educational and professional trajectories. Performance during these years influences university admissions, scholarship eligibility, and career direction. Thus, any factor that potentially undermines academic focus or learning efficiency demands serious investigation.

This research aims to contribute to academic discourse by examining the specific relationship between the amount of time spent on digital social media and academic performance among senior secondary students. Unlike general studies that evaluate the effects of social media in broad terms, this study zeroes in on time-based usage patterns and correlates them with academic outcomes, offering actionable insights for stakeholders in education. The central hypothesis is that excessive, unregulated use of social media correlates with lower academic performance, whereas moderate, purposeful use may not be as detrimental—and may even offer educational benefits under the right conditions.

2. Literature Review

Several studies globally and within India have examined how digital behavior affects student outcomes. Junco (2012) and Kirschner & Karpinski (2010) found that time spent on platforms such as Facebook had a negative correlation with academic grades. These findings are corroborated by Indian researchers like Patel & Mehta (2019), who found that students frequently distracted by apps like Instagram and WhatsApp reported lower scores. Contrastingly, other research suggests that not all digital engagement is harmful. Educational platforms like YouTube or academic groups on WhatsApp can offer supplemental instruction and foster collaborative learning (Ghosh & Roy, 2018). According to Verma & Choudhury (2021), the distinction between productive and passive usage is key. Productive use includes seeking out tutorials and participating

in academic forums, while passive use involves endless scrolling and social comparison, which often leads to procrastination and cognitive fatigue.

Woods and Scott (2016) emphasized that nighttime use of social media disrupts sleep, contributing to emotional instability and reduced academic focus. Similarly, Twenge et al. (2017) observed that the increasing screen time among adolescents is linked to diminished happiness and academic motivation. Ravi and Mehta (2019) highlighted how students who engage in academic groups and motivational pages tend to have more structured study routines. In contrast, Desai & Mehta (2019) found that social media addiction correlates strongly with lower GPA scores among Indian secondary students.

Kumar and Choudhury (2020) pointed out that digital multitasking during class hours, including switching between educational content and social media, significantly reduces attention span and retention. Saini & Sharma (2019) showed that students who set limits on their usage experienced improved sleep and better academic outcomes. In a comprehensive study by Keles, McCrae, and Grealish (2020), a meta-analysis revealed that social media use is associated with increased levels of depression, anxiety, and psychological distress, which are known to adversely affect academic outcomes. Meanwhile, Rosen et al. (2013) demonstrated that frequent task-switching between social media and academic tasks impairs concentration and leads to reduced test performance.

Kandell (1998) discussed the concept of internet addiction and its manifestation through compulsive social media use, highlighting the potential for such behavior to displace academic priorities. Valkenburg and Peter (2007) provided evidence that while moderate social media use enhances social connectedness and self-esteem, excessive use leads to social withdrawal and academic underperformance. This dichotomy underscores the importance of studying both the quantity and the quality of social media engagement. While previous studies established broad associations, this research narrows the focus to time-based usage patterns and seeks to offer actionable insights based on the amount of time spent online daily.

3. Methodology

This section outlines the research design, sampling procedures, instruments used for data collection, and statistical techniques applied for analyzing the data. The primary aim of the study was to examine the relationship between time spent on social media and academic performance

among senior secondary students. The study sought to identify whether a statistically significant correlation exists between these variables, and to explore the nature and extent of that relationship.

3.1 Research Design

The study adopted a descriptive correlational research design, which is a non-experimental approach commonly used in the social sciences to investigate the degree to which two or more variables are related. In this study, the focus was on understanding whether there exists a correlation between the amount of time students spend on social media and their academic performance. The design is "descriptive" because it involves the collection of data that describe the characteristics of the phenomenon under investigation, and "correlational" because it involves the analysis of relationships among naturally occurring variables, without manipulating any conditions or groups.

This design is particularly appropriate for the current study because it enables the researcher to capture real-world data and assess naturally occurring patterns of behavior without intervention, thus preserving the ecological validity of the research.

3.2   Population and Sample

The target population consisted of senior secondary school students (grades 11 and 12) from Kendriya Vidyalayas located in urban and semi-urban areas of Patna, Bihar. These schools are part of a national network of central government schools in India, and they provide a relatively uniform academic environment, making them an ideal setting for such a study.

A sample of 800 students was selected, ensuring a balanced representation across:

- Academic grades (11th and 12th)
- Streams of study (Science, Commerce, Humanities)
- Gender and socio-economic background (insofar as possible within the constraints of school populations)

This relatively large sample size improves the generalizability and reliability of the findings and helps reduce sampling error.

3.3 Sampling Technique

To ensure comprehensive representation of the student population, stratified random sampling was employed. In this approach, the population was divided into strata based on academic stream— Science, Commerce, and Humanities. From each stratum, a random sample of students was drawn proportionately to the size of the stratum in the population. This method ensured that each academic stream was adequately represented in the final sample.

The selection process involved coordination with school administrators and class teachers, who provided rosters and facilitated access to classrooms for the administration of the survey. Care was taken to avoid selection bias by randomly selecting students from within each stream.

3.4 Data Collection Tools

Two primary instruments were used for data collection: a structured questionnaire for measuring social media usage and academic records for assessing academic performance.

3.4.1 Social Media Usage Questionnaire

A self-designed, structured questionnaire was developed to measure students' average daily usage of various social media platforms. The questionnaire included both closed-ended and multiple-choice questions to ensure ease of response and standardization of data. Students were asked to report on the average amount of time they spent on the following platforms per day:

- Facebook
- Instagram
- WhatsApp
- TikTok
- YouTube

For each platform, students selected from the following time-use categories:

- Less than 1 hour
- 1 to 2 hours
- 2 to 3 hours
- More than 3 hours

The questionnaire also included demographic questions (e.g., age, gender, grade, academic stream) to allow for subgroup analysis. Before full deployment, the instrument was pilot-tested on a small group of 30 students to assess clarity, reliability, and relevance. Necessary revisions were made based on feedback.

3.4.2 Academic Performance Data

To ensure objectivity and validity in assessing academic achievement, students' academic performance data were collected from official school records. Specifically, the half-yearly examination scores in core subjects were used as a standardized measure of performance. These scores are regularly maintained by school administrations and reflect performance in assessments designed and administered uniformly across the schools.

All data collection procedures adhered to ethical standards, including informed consent, confidentiality, and voluntary participation. No identifying personal data was recorded.

3.5 Data Analysis Techniques

Once data were collected, they were coded and entered into statistical software package (SPSS version 16 or R) for analysis. A combination of descriptive and inferential statistical techniques was used to analyze the data.

3.5.1 Descriptive Statistics

Initial analysis focused on descriptive statistics to summarize the sample characteristics and patterns of social media usage. These included:

- Frequencies and percentages to describe categorical variables (e.g., time spent on platforms).
- Means and standard deviations to summarize academic scores across the sample.
- Cross-tabulations to explore patterns across gender, academic stream, and grade level.

These statistics provided a clear overview of the dataset and informed further inferential analysis.

3.5.2 Pearson's Correlation Coefficient

To assess the linear relationship between social media usage (measured in time categories) and academic performance (measured in exam scores), Pearson's r was calculated. This test measures the strength and direction of correlation:

- **$r > 0$** indicates a positive correlation
- **$r < 0$** indicates a negative correlation
- **$r = 0$** suggests no linear correlation

The test assumes linearity, normal distribution of variables, and homoscedasticity. Preliminary checks (e.g., scatterplots, Shapiro-Wilk test) were performed to verify that these assumptions were reasonably met.

3.5.3 Analysis of Variance (ANOVA)

To further explore differences in academic performance among students who reported different levels of social media usage, a one-way Analysis of Variance (ANOVA) was conducted. The independent variable was the category of average daily social media usage (four levels), and the dependent variable was the academic score.

ANOVA tested the null hypothesis that the mean academic scores are equal across all groups. A significant F-value ($p < 0.05$) indicated that at least one group differed significantly. Where significance was found, post hoc tests (Tukey's HSD) were applied to determine specific group differences.

3.6   Ethical Considerations

This study strictly adhered to ethical standards in educational research. Key ethical principles observed included:

- Informed consent: All participants were informed about the purpose of the study and participated voluntarily.
- Confidentiality: Responses were anonymized, and no identifying information was collected.
- Data protection: Collected data were stored securely and used solely for academic purposes.

Approval was obtained from school authorities and, where necessary, from local educational boards.

4. Results

4.1 Descriptive Statistics

The study revealed the following distribution of social media usage among students:

- 28% reported using social media for less than 1 hour per day
- 35% used it for 1–2 hours
- 23% for 2–3 hours
- 14% for more than 3 hours

Academic performance was inversely related to usage duration:

- Students using social media <1 hour/day scored an average of 78.4%
- 1–2 hours/day: 73.2%
- 2–3 hours/day: 68.5%
- 3 hours/day: 63.9%

4.2 Correlation and Inferential Analysis

The Pearson correlation coefficient between social media time and academic performance was -0.61 ($p < 0.01$), indicating a moderate to strong negative correlation. ANOVA results showed significant differences in mean academic scores across usage categories ($F = 19.43$, $p < 0.001$). These results suggest that as time spent on social media increases, academic performance tends to decline.

5. Discussion

This study supports the hypothesis that digital distractions—primarily caused by excessive social media usage—negatively influence academic outcomes. Students who spend more than three hours daily on platforms like Instagram, TikTok, or WhatsApp perform significantly worse academically.

The findings are consistent with the cognitive load theory, which posits that multitasking or overloading cognitive systems with non-academic stimuli reduces working memory availability for meaningful learning. Overexposure to online content also fragments attention spans, reduces study hours, and interferes with sleep, further compounding academic difficulties.

Interestingly, students using social media for moderate durations (1–2 hours) did not suffer as much, implying that a balanced approach might even facilitate academic engagement, especially if usage is directed toward educational content. This aligns with the "productive vs. passive use" paradigm in recent literature.

Another notable observation was the lack of awareness among students regarding time management and the addictive nature of social media. Interviews and qualitative responses revealed that many students failed to perceive their usage as excessive or harmful, despite poor academic outcomes.

6. Implications

6.1 Educational Practice

Schools need to introduce digital literacy modules that teach students how to manage online distractions, identify productive digital behavior, and use social media responsibly. Teacher training programs should also address ways to incorporate educational technology without promoting dependency on non-academic platforms.

6.2   Parental Involvement

Parents must be made aware of their children's digital habits and encouraged to set limits on screen time. Practical tools such as screen-time tracking apps, digital curfews, and reward systems for reduced usage can be implemented.

6.3   Student Self-Management

Students must be taught effective time management strategies, such as the Pomodoro Technique or time-blocking methods. Encouraging self-regulation and reflective journaling on digital habits can help cultivate discipline.

6.4   Policy Recommendations

The Ministry of Education should consider integrating digital wellness education into school curricula. Policies should also promote safe and productive online environments, particularly targeting adolescents in high-risk usage categories.

7.   Limitations and Future Research

This study is limited to self-reported data, which may introduce response bias. Additionally, academic performance was measured only through examination scores, which might not capture holistic learning outcomes.

Future research should consider longitudinal designs to assess long-term academic impacts and incorporate qualitative methods to explore students' motivations behind social media usage. Experimental studies could also be conducted to test the effectiveness of specific interventions aimed at reducing digital distractions.

8. Conclusion

The present study concludes that there is a statistically significant negative correlation between the amount of time spent on digital social media platforms and academic performance among senior secondary students. This finding suggests that as students increase their daily usage of platforms such as Facebook, Instagram, WhatsApp, TikTok, and YouTube, their academic scores tend to decline. While the relationship observed is correlational rather than causal, it underscores the critical influence that unregulated digital behavior can have on students' cognitive focus, study habits, and academic outcomes. The negative academic impact of excessive social media use may stem from various factors, including reduced study time, sleep disturbances, decreased concentration, and increased exposure to distractions. However, it is important to note that not all social media use is detrimental; when used in a controlled and purposeful manner, certain platforms can provide academic support through access to educational content, peer collaboration, and information-sharing. The key concern lies in the lack of digital self-regulation and the habitual, often compulsive, nature of social media consumption among adolescents. Given these dynamics, the study highlights the urgent need for a coordinated response from educators, parents, and policymakers to foster healthier digital habits among students. Recommendations include the implementation of school-based intervention programs, peer-led awareness initiatives, and the use of screen time tracking apps to encourage self-monitoring. Despite the significance of the findings, the study acknowledges certain limitations, including reliance on self-reported usage data, limited geographic scope confined to Kendriya Vidyalayas in Patna, Bihar, and the non-experimental nature of the research design. Future studies should explore longitudinal data and potential mediating factors such as sleep quality, anxiety, and motivation to better understand how social media influences academic outcomes over time. Nonetheless, the study contributes important insights into the academic risks associated with unchecked digital consumption and reinforces the need for strategic, collaborative action to help students cultivate balanced, productive relationships with technology. As digital tools become increasingly embedded in education and daily life, ensuring that students are equipped with the skills and support to manage their online behavior is not just beneficial, it is essential for their academic success and overall well-being.

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